

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**PATENT APPLICATION**

Applicants : David H. Williams et al.

Application No. : 10/531,532 Confirmation No. : 3090

National Phase Filing Date : April 15, 2005

35 U.S.C. 371 National Phase of : PCT/US03/32812

International Application Filing Date : October 16, 2003

For : SPLEEN TYROSINE KINASE CATALYTIC DOMAIN:  
CRYSTAL STRUCTURE AND BINDING POCKETS THEREOF

Group Art Unit : Not Yet Assigned

Examiner : Not Yet Assigned

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

New York, New York  
May 31, 2006

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Date of Deposit: May 31, 2006

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Enclosures:

  
Isatta B. Smith

1. Transmittal Letter (in duplicate);
2. Information Disclosure Statement;
3. Form PTO/SB.08a (in duplicate);
4. Form PTO/SB.08b (in duplicate);
5. Copies of References (1 Foreign Patent Document and 95 Non Patent Literature Documents); and
6. Postcard

Express Mail Label  
EV 619642507 US

Attorney Docket No. MNM/001

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Commissioner for Patents  
P.O. Box 1450 New York, New York  
Alexandria, VA 22313-1450 May 31, 2006

TRANSMITTAL LETTER FOR  
INFORMATION DISCLOSURE STATEMENT

Sir:

Transmitted herewith are: (1) Information Disclosure  
Statement; (2) Form PTO/SB/08a (in duplicate); (3) Form  
PTO/SB/08b (in duplicate); (4) Copies of References (1 Foreign  
Patent Document and 95 Non Patent Literature Documents); (5)

Express Mail Certificate; and (6) Postcard in the above-identified application.

This Statement is submitted more than three months from the application filing date but before the mailing date of the first Office Action on the merits. In accordance with 37 C.F.R. § 1.97, submission of this Statement requires no fee. However, if for any reason a fee is due, the Director is hereby authorized to charge payment of any fees required in connection with this Information Disclosure Statement to Deposit Account No. 06-1075, Order No: 002859-0008. A duplicate copy of this letter is transmitted herewith.

Respectfully submitted,

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Alexandria, VA 22313-1450 May 31, 2006

INFORMATION DISCLOSURE STATEMENT

Sir:

Pursuant to 37 C.F.R. §§ 1.56 and 1.97, applicants  
make the following references of record in the above-  
identified patent application:<sup>1</sup>

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<sup>1</sup> Applicants submit herewith Forms PTO/SB/08a and PTO/SB/08b, with the references listed therein. Applicants also provide copies of all non-United States Patent documents herewith.

#### United States Patents

<u>Inventor</u>	<u>Patent No.</u>	<u>Issue Date</u>
Carter et al.	4,886,646	December 12, 1989
McPherson et al.	5,096,676	March 17, 1992
* Carter et al.	5,130,105	July 14, 1992
Kushner et al.	5,221,410	June 22, 1993
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Srinivasan et al.	5,884,230	March 16, 1999

#### Foreign Patent Documents

* PCT	WO 2004/029236 A1	April 8, 2004
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The documents denoted above with a (\*) were cited in a February 15, 2005 International Search Report issued in connection with the International application PCT/US03/32812, of which this application is a National Stage filing of under 35 U.S.C. §371.

Applicants respectfully request that all of the above-cited documents be (1) fully considered by the Examiner during the course of the examination of this application and (2) printed on any patent issuing from this application. Applicants also request that a copy of the enclosed Form PTO-1449, duly initialed by the Examiner, be forwarded to the undersigned with the next official communication.

Applicants request favorable action in this application.

Respectfully submitted,



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Substitute for form 1449A/PTO

# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1 of 1

## **Complete if Known**

Application Number	10/531,532
Filing Date	April 15, 2005 (National Phase)
First Named Inventor	David H. Williams, et al.
Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	MNM/001

## **U. S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
		us- 4,886,646	12-12-1989	Carter et al.	
		us- 5,096,676	03-17-1992	McPherson et al.	
		us- 5,130,105	07-14-1992	Carter et al.	
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## **FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	† <sup>6</sup>
		Country Code <sup>3</sup> "Number" <sup>4</sup> "Kind Code" <sup>5</sup> (if known)				
		WO 2004/029236 A1	04-08-2004	Geiser et al.		

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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Substitute for form 1449B/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		<b>Complete if Known</b>			
		Application Number	10/531,532		
		Filing Date	April 15, 2005 (National Phase)		
		First Named Inventor	David H. Williams, et al.		
		Art Unit	Not yet assigned		
		Examiner Name	Not yet assigned		
Sheet	1	of	10	Attorney Docket Number	MNM/001

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		Alberola-Ila et al, "Differential Signaling By Lymphocyte Antigen Receptors", <i>Annu. Rev. Immunol.</i> , 15: 125-154 (1997)	
		Balbes et al, "A Perspective of Modern Methods in Computer-Aided Drug Design", in <i>Reviews in Computational Chemistry</i> , K. B. Lipkowitz and D. B. Boyd, Eds., VCH Publishers, Inc., New York 5: 337-379 (1994)	
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		Böhm, "The Computer Program LUDI: A New Method for the De Novo Design of Enzyme Inhibitors", <i>J. Comp. Aid. Molec. Design</i> , 6: 61-78 (1992)	
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		Brünger et al, "Crystallography & NMR System: A New Software Suite for Macromolecular Structure Determination" <i>Acta Cryst.</i> , D54: 905-921 (1998)	
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		Chan et al, "Differential Expression of ZAP-70 and Syk Protein Tyrosine Kinases, and the Role of This Family of Protein Tyrosine Kinases in TCR Signaling" <i>J. Immunol.</i> , 152: 4758-4766 (1994)	
		Chayen, "A Novel Technique to Control the Rate of Vapour Diffusion, Giving Larger Protein Crystals" <i>J. Appl. Cryst.</i> , 30: 198-202 (1997)	

Examiner Signature		Date Considered	
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First Named Inventor	David H. Williams, et al.
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		Cory and Bentley, "MATCHMOL, an Interactive Computer Graphics Procedure For Superposition of Molecular Models", <i>J. Mol. Graphics</i> , 2: 39-42 (1984)	
		D'Arcy et al, "A Novel Approach To Crystallising Proteins Under Oil", <i>J. Cryst. Growth</i> , 168: 175-180 (1996)	
		Dayhoff et al, "A Model of Evolutionary Change in Proteins", <i>Atlas of Protein Sequence and Structure</i> , 5: 345-352 (1978)	
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		Fetrow and Bryant, "New Programs for Protein Tertiary Structure Prediction", <i>Bio/Technology</i> , 11: 479-484 (1993)	

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		Giet and Prigent, "Aurora/Ipl1p-Related Kinases, a New Oncogenic Family of Mitotic Serine-Threonine Kinases", <i>J. Cell. Sci.</i> , 112: 3591-3601 (1999)	
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		Goodsell and Olson, "Automated Docking of Substrates to Proteins by Simulated Annealing", <i>Proteins Struct. Funct. Genet.</i> , 8: 195-202 (1990)	
		Greer, "Comparative Modeling of Homologous Proteins", <i>Meth. in Enzymol.</i> , 202: 239-252 (1991)	
		Gschwend et al, "Molecular Docking Towards Drug Discovery", <i>J. Mol. Recog.</i> , 9: 175-186 (1996)	

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		Hubbard et al, "Crystal Structure of the Tyrosine Kinase Domain of the Human Insulin Receptor", <i>Nature</i> , 372: 746-754 (1994)	
		Jin et al, "The Three-Dimensional Structure of the ZAP-70 Kinase Domain in Complex with Staurosporine", <i>J. Biol. Chem.</i> , 279: 42818-42825 (2004)	
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Application Number	10/531,532
Filing Date	April 15, 2005 (National Phase)
First Named Inventor	David H. Williams, et al.
Art Unit	Not yet assigned
Examiner Name	Not yet assigned
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		Szklarz and Halpert, "Use of Homology Modeling in Conjunction with Site-Directed Mutagenesis for Analysis of Structure-Function Relationships of Mammalian Cytochromes P450", <i>Life Sci.</i> , 61: 2507-2520 (1997)	
		Tapia et al, "Computer Assisted Simulation and Molecular Graphics Methods in Molecular Design. 1. Theory and Applications to Enzyme Active-Site Directed Drug Design", <i>Molecular Engineering</i> , 3: 377-414 (1994)	
		Turner et al, "Perinatal Lethality and Blocked B-Cell Development in Mice Lacking the Tyrosine Kinase Syk", <i>Nature</i> , 378: 298-302 (1995)	
		Turner et al, "Tyrosine Kinase SYK: Essential Functions for Immunoreceptor Signalling", <i>Immunology Today</i> , 3: 148-154 (2000)	
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		Wishart et al, "Constrained Multiple Sequence Alignment Using XALIGN", <i>Comput. Appl. Biosci.</i> , 10: 687-688 (1994)	
		Woodside et al, "The N-Terminal SH2 Domains of Syk and ZAP-70 Mediate Phosphotyrosine-Independent Binding to Integrin $\beta$ Cytoplasmic Domains", <i>J. Biol. Chem.</i> , 277: 39401-39408 (2002)	
		Xie et al, "Crystal Structure of JNK3: A Kinase Implicated in Neuronal Apoptosis", <i>Structure</i> , 6: 983-991 (1998)	
		Yamada et al, "IL-1 Induced Chemokine Production Through the Association of Syk with TNF Receptor-Associated Factor-6 in Nasal Fibroblast Line", <i>J. Immunol.</i> , 167: 283-288 (2001)	
		Yamamoto et al, "Development of a High-Throughput Fluoroimmunoassay for Syk Kinase and Syk Kinase Inhibitors", <i>Anal. Biochem.</i> , 315: 256-261 (2003)	

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		Yeh and Hol, "A Flash-Annealing Technique to Improve Diffraction Limits and Lower Mosaicity in Crystals of Glycerol Kinase", <i>Acta Cryst.</i> , D54: 479-480 (1998)	
		Zhang et al, "Phosphorylation of Syk Activation Loop Tyrosines is Essential for Syk Function", <i>J. Biol. Chem.</i> , 275: 35442-35447 (2000)	
		Zhu et al, "Structural Analysis of the Lymphocyte-Specific Kinase Lck in Complex with Non-Selective and Src Family Selective Kinase Inhibitors", <i>Structure</i> , 7: 651-661 (1999)	
		Zioncheck et al, "Generation of an Active Protein-Tyrosine Kinase from Lymphocytes by Proteolysis", <i>J. Biol. Chem.</i> , 263: 19195-19202 (1988)	
		"The CCP4 Suite: Programs for Protein Crystallography", Collaborative Computational Project Number 4, <i>Acta Cryst.</i> , D50: 760-763 (1994)	

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